

Application No.: 10/528,690
Amendment under 37 CFR 1.111
Reply to Office Action dated December 29, 2008
February 17, 2009

AMENDMENTS TO THE CLAIMS

Please substitute the following claims for the pending claims with the same numbers respectively:

Claim 1 (Currently amended): A device for bonding objects to be bonded each having a metal bonding portion on a surface of a substrate, comprising:

cleaning means for exposing the surfaces of the metal bonding portions to a plasma having an energy enough to etch the surfaces of the metal bonding portions at a depth of 1.6 nm or more over the entire surfaces of the metal bonding portions under a reduced pressure,

wherein said cleaning means ~~comprises~~ includes an argon plasma irradiating means; and

bonding means for bonding the metal bonding portions of the objects taken out of said cleaning means to each other in an atmospheric air,

wherein said bonding means ~~has~~ includes a heating mechanism ~~and bonds~~ capable of heating the ~~metal~~ bonding portions to ~~each other at~~ a temperature of 180°C or lower,

Application No.: 10/528,690
Amendment under 37 CFR 1.111
Reply to Office Action dated December 29, 2008
February 17, 2009

wherein said bonding means includes a dispersion means for making a dispersion of a gap between the metal bonding portions at the time of bonding to be 4µm or less at a maximum,

wherein said bonding means includes a roughness means for making a surface roughness of at least one metal bonding portion after bonding to be 10 nm or less,

wherein said bonding means includes an adjusting means for bonding the metal bonding portions to each other at a bonding load of 300 MPa or less,

wherein said bonding means includes means capable of adjusting a parallelism in a bonding area between substrates at the time of bonding the metal bonding portions to each other at 4µm or ~~less~~ less, and

wherein the surfaces of the metal bonding portions to be bonded to each other are both formed from ~~gold~~ gold,

a surface roughness of at least one metal bonding portion before bonding is made to be 100 nm or ~~less~~ less, and

~~a surface hardness of the metal bonding portions is set at~~
have 100 or less in Vickers hardness [[Hv;]] and are in a form
of

~~at least one of the metal bonding portions is formed by a~~
plurality of ~~bumps~~ and bumps, wherein the bumps of each of the

Application No.: 10/528,690
Amendment under 37 CFR 1.111
Reply to Office Action dated December 29, 2008
February 17, 2009

metal bonding portions have a dispersion of bump height ~~[[is]]~~
of 4 μ m or less.

Claims 2-26 (Cancelled):